

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band)	WT Docket No. 08-166
)	
Public Interest Spectrum Coalition Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition)	WT Docket No. 08-167
)	
Amendment of Parts 15, 74 and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones)	ET Docket No. 10-24
)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions)	GN Docket No. 12-268
)	

**COMMENTS OF
THE BROADWAY LEAGUE, INC.**

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**COMMENTS OF
THE BROADWAY LEAGUE, INC.**

I. Introduction and Summary.

The Broadway League, Inc. (the “League”) submits these comments to refresh the Commission’s record in its “TV White Spaces” and “Wireless Microphone” proceedings¹ and respond to specific questions affecting the use of the broadcast television channels by wireless microphones, intercoms, and cue-and control devices² posed in the Incentive Auction Notice.³

¹ “The Wireless Telecommunications Bureau and the Office of Engineering and Technology Seek to Update and Refresh Record in the Wireless Microphone s Proceeding,” *Public Notice*, DA 12-1570 in WT Dockets Nos. 08-166 and 08-167, ET Docket No. 10-24 (released October 5, 2012) (the “Wireless Microphone PN”).

² Collectively hereinafter, “wireless microphones.”

In response to specific questions asked by the Commission, the Broadway League recommends and requests:

- Professional theatrical productions have needs similar to other parties currently licensed under Part 74 rules.
- Venue owners, producers, audio engineers, and sound designers providing services to theatres should be eligible for Part 74 licenses.
- The thirty-day advance registration notice is unworkable in certain professional theatre situations.
- The requirement to use all practicably available channels is problematic for certain professional theatrical applications.
- The Commission's public notice provision has inadequate procedural safeguards for a content-neutral prior restraint of protected speech.
- Part 74 licenses will solve problems arising from the thirty-day notice process.
- The number of wireless units used in a production is not a viable criterion for license eligibility. If the Commission finds that a quantitative threshold is necessary, the number of seats in a theatre (500 or more) would be the most appropriate.
- The repacking of television spectrum will create additional challenges for large-scale productions using wireless microphones.
- The elimination of two channels designated for wireless microphones would have the greatest impact on smaller wireless microphone users and would result in more requests for database registration. Positioning designated wireless microphones in a market on the same side of unusable channel 37 would be more efficient than the current plan.
- Wireless microphones could make effective use of guard bands in the television spectrum, but database access by microphones is unlikely to work.
- A 50 mW power limit is acceptable for wireless microphones in theatres.
- Professional theatres welcome the introduction of more spectrally efficient equipment and will specify it when it delivers professional-quality sound at a reasonable price.

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³ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, FCC 12-118, Notice of Proposed Rulemaking in GN Docket No. 12-268, FCC 12-118 (released October 2, 2012) (the "Auction Notice").

II. The Professional Theatre Industry Should Be Eligible for Part 74 Licenses.

The Broadway League is the national trade association for the Broadway industry.⁴ Its over 700 members include theatre owners and operators, producers, road-presenters and general managers in North America, as well as suppliers of associated goods and services. Each year League members provide Broadway productions to more than 30 million people in New York City – a \$10 billion industry – the city’s largest tourist attraction, directly employing over 10,000 people and supporting another 80,000 full-time positions including hotel and restaurant workers. League members also present Broadway productions in approximately 200 other cities across the U.S., adding an additional \$3 billion in spending to the economy. In the operation of these productions, League members are major users of wireless microphones.

The League has previously participated in the TV White Spaces and Wireless Microphone proceedings as a member of the Coalition of Wireless Microphone Users, in which it was joined by national and regional organizations representing not-for profit, educational, and resident theatres; major national sports leagues; and others concerned about the ability to continue to use wireless microphones to provide world-class sound experiences to audiences across the nation.⁵ Since the previous round of comments in these proceedings, the Commission has tested two of the databases that will control the cognitive radio technology used by TV Band Devices. This system, as yet untried in large-scale commercial use, is designed to permit new

⁴ See www.broadwayleague.com

⁵ See, e.g., “Opposition of the Coalition of Wireless Microphone Users to Petitions for Reconsideration, ET Dockets Nos. 04-186 and 02-380 (May 8, 2009); “Reply of the Coalition of Wireless Microphone Users to Oppositions to Petitions for Reconsideration,” ET Dockets Nos. 04-186 and 02-380 (May 18, 2009); “Comments of the Coalition of Wireless Microphone Users,” WT Dockets Nos. 08-186 and 08-187 and ET Docket No. 10-24 (March 1, 2010); and “Reply Comments of the Coalition of Wireless Microphone Users,” WT Dockets Nos. 08-166 and 08-167 and ET Docket No. 10-24 (March 22, 2010).

devices to share the TV spectrum with existing users. In another development, Congress has provided the Commission with authority and a directive to reduce the amount of spectrum allocated to broadcast television, which is shared by wireless microphones and future TV Band Devices. These factors add new urgency to the need to modify the Commission's Part 74, Subpart H rules to provide eligibility for Low Power Auxiliary Station ("LPAS") licenses to Broadway League members and other similarly situated, professionally staffed performance venues, producers, audio engineers and sound designers.

The Broadway League, along with everyone involved with the performing arts and presentations before live audiences, is placing its trust in the Commission's ability to make the TV Band database and its registration process a flawless operation.⁶ The technological reality is that, because of the low power and relatively isolated locations of wireless microphones in near proximity to paired receivers, they do not interfere with other users. However, because of the same factors of low power and location, it is easy for other users of the same spectrum to overpower wireless microphones. But for the ability to shut down new unlicensed devices through the database and cognitive radio technology, TV Band Device interference could devastate the sound and stagecraft at major productions, potentially causing physical harm to actors and production workers,⁷ serious artistic and cultural losses, and – considering the importance of live entertainment to the American economy – significant financial damage.

⁶ League representatives have participated in the Beta Test and know from that experience that its use will be challenging but critical.

⁷ Cue and control devices used by stagehands and technical staff prevent accidents and personal injury from moving props and scenery and special effects such as pyrotechnics.

The Commission recognizes that “[t]he overwhelming majority of unlicensed wireless microphone uses do not qualify for registration for database protection.”⁸ Small scale users of wireless microphones will be capable of providing adequate service using TV channels not available to TV Band Devices including the two channels designated for unlicensed wireless microphones.⁹ However, professional theatrical productions utilizing professional sound engineering and providing a professional quality audio experience cannot risk that interference-free channels will be available.

1. Large Theatrical Productions Have Needs Similar to Those of LPAS Licensees.

The Commission has noted that live theatrical productions/shows, such as those on Broadway and in other large regional venues, are likely to require database registration.¹⁰ It referred to theatrical and sports productions and other major events that can use more than 100 wireless microphones.¹¹ The professionals responsible for such large-scale audio production endeavors should be eligible for LPAS licenses.

Wireless microphones are invaluable for live stage productions. They allow audiences to clearly hear performers’ voices without interfering with freedom of on-stage movement. They can be unobtrusively positioned or hidden in costumes to enhance the dramatic

⁸ “Office of Engineering and Technology and Wireless Telecommunications Bureau Announce the Initial Launch of Unlicensed Wireless Microphone Registration System,” *Public Notice* in ET Docket No. 04-186, DA 12-1514 at 4 (released September 19, 2012) (“Registration Public Notice”) (emphasis in the original).

⁹ The Auction Notice, however, asks whether these channels should be made available for use by TV Band Devices as well. Auction Notice, ¶ 238.

¹⁰ Registration Public Notice, at 4.

¹¹ Auction Notice, ¶ 223.

experience. Wireless intercoms, including “IFBs.” and cue and control devices distribute stage directions and enable movement of set pieces and the execution of special effects without danger to performers and stagehands. Wireless microphones communicate over short distances within enclosed and controlled theatre environments. Thus, they can be controlled and carefully coordinated, especially in areas like Broadway, where many theatres have reused the same frequencies for decades without interfering with each other or other users of the television spectrum. Although used intensively, wireless microphones do not operate constantly: their use is limited to times of set-up and testing, rehearsal, and actual performances.

The Commission’s inquiry into the expansion of eligibility for Part 74 licenses¹² mirrors the understanding that the agency has held since it initially developed rules for wireless microphones and noted that “there are other groups such as producers of live entertainment programs who also have needs similar to those of broadcast licensees”¹³ The Commission listed five specific needs to be satisfied by LPAS wireless microphones: (1) Freedom of movement; (2) Freedom from interference; (3) Reasonable size; (4) Audio quality; and (5) An adequate number of channels to permit multiple microphones during large performances.¹⁴

In response to a request from the Association of Motion Picture and Television Producers, the Commission made motion picture and television producers eligible for LPAS licenses.¹⁵ The Commission later opened the door to wireless microphone licensing for cable

¹² Wireless Microphone PN, at 3.

¹³ *Amendment of Part 2, and Subpart D, Part 74, of the Commission’s Rules and Regulations, With Respect to the Use of Wireless Microphones*, 63 F.C.C. 2d 535(1977) ¶ 29 (Initial Wireless Microphone Order).

¹⁴ *Wireless Microphones*, Inquiry and Proposed Rulemaking, 39 Fed. Reg. 35184-85 (September 30, 1974).

¹⁵ Initial Wireless Microphone Order, ¶ 31.

companies. Now the Commission should follow through and extend eligibility to producers of professional large-scale live entertainment offerings. Live performances meet each of the needs originally designated by the Commission. Moreover, their need for interference-free professional-quality operations is more vital than that for producers of motion pictures and recorded television programming. There is no “Take Two” in live theatre.

2. The Thirty-day Waiting Period Would Cause Significant Hardship to Professional Theatre.

One of the most significant differences between the operation of wireless microphones by LPAS licensees and that of unlicensed users is the requirement for advanced submission of eligibility criteria to the Commission and a thirty-day notice and comment period. The delay will be unworkable in many professional theatre situations.

For example, touring companies bringing a Broadway musical production must arrive in a city, take over a venue that is essentially an empty shell with seats and outfit it with a world-class sound system in a matter of days. To make this possible, the touring company will bring its own wireless microphone equipment. It must make immediate adjustments to coordinate with TV broadcasters and other known users in the vicinity of the theatre. There may well be frequencies that are unusable because of regular or sporadic use by unidentified parties. Only after this on-site coordination will a touring-company know whether it will need to register in the database for protection on additional channels. There simply is no opportunity for a thirty-day notice and comment procedure.

Even productions that are planned for long runs in a single theatre would have problems with the thirty-day advance notice. Many of these productions use the services and rental equipment of audio engineering contractors who will not begin work – and especially will

not purchase new equipment – until they have a contract with the producer along with a deposit. These are details that must be left to the final days of pre-production. Thus, by the time the audio engineers create their microphone plan for the production and survey the spectrum at the site, there is, again, no opportunity for a thirty-day comment window.

A second major difference between unlicensed operations and Part 74 procedures is the requirement that unlicensed users “certify that they are making use of all TV channels not available to TV band devices and on which wireless microphones can practicably be used.”¹⁶ A touring company will often travel with its own audio system, which may include high-quality wireless microphone transmitters sewn into costumes or otherwise dedicated to the production. As this production moves from city to city, it will encounter different channels that are available to wireless microphones but unavailable to TV Band Devices. Audio engineers must avoid interference to licensed users, including television stations. In many cases it will be impossible to certify that the equipment it has will fill every available channel. More likely, there will be some unused available channels and a need for some additional channels for a limited number of hours during the limited run of a production in a city. Requiring a waiver for this would add to the burden of the thirty-day notice period and make operation of a touring company on an unlicensed basis even more impossible.¹⁷ Any delay beyond the thirty-day period (for instance,

¹⁶ 47 C.F.R. § 15.713(h)(9). Cf. 47 C.F.R. § 15.713(h)(8) (providing database registration for licensed wireless microphone users without requiring the use of every practicable channel not available to TV Band Devices). The Commission has wisely determined that VHF channels cannot currently be practicably used because there is no professional-grade equipment available for use on that area of the spectrum. See Registration Public Notice, at 5.

¹⁷ A third difference between Part 74 licensed operations and unlicensed operations under proposed Part 15 rules is the permissible power level for devices. Proposed rule 47 C.F.R. § 15.238(d) would limit unmodulated carrier power at the antenna input to 50 mW for unlicensed units. *Amendment of Part 15, 74 and 90 of the Commission’s Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones*, 25 FCC Rcd 643, 734 (2010), App. E. Under Part 74, LPAS devices may use
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in response to objections filed on the 29th day) could create additional, unexpected problems with scheduled performances that could cascade into disruptions to ticket sales, hotel and restaurant reservations, transportation plans, and a host of other industries aligned with the performing arts.

3. The Commission's Thirty-Day Notice Rule Has Inadequate Procedural Safeguards for a Prior Restraint of Protected Speech.

During the thirty-day waiting period for unlicensed wireless microphone database registration, the Commission intends to make the proposed registrations public and provide an opportunity for comments and objections.¹⁸ The Commission's rule, Section 15.713(h)(9),¹⁹ places no constraints on the type of comments or objections that the Commission will accept. Nor does it explain what the Commission will do in response to public objections, whether the registration applicant will have an opportunity to respond, or what recourse the applicant would have if it is not permitted to register.

An open public invitation to object to channel use for a scheduled performance will be used as a pretext for objecting to the content of that performance, mirroring the Commission in a new area of First Amendment issues. The Broadway stage has long embraced freedom of expression that sometimes exceeded conventional standards. Widely performed musicals like "Hair" (1967), "Cabaret" (1966), and even "West Side Story" (1957) were controversial at the time of their debuts. The Commission should reasonably expect to receive objections ostensibly

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up to 250 mW in the UHF TV bands. Because of the need for coordination on Broadway and in other frequency congested areas and considering the proximity of performers and receivers, a 50 mW power limit presents no problem and 250 mW provides no advantage for wireless microphone users.

¹⁸ 47 C.F.R. § 15.713(h)(9).

¹⁹ Stating in relevant part: "The Commission will make requests for registration of sites that use unlicensed wireless microphones public and will provide an opportunity for public comment or objections."

directed at database registrations, but actually filed to interfere with the presentation of shows like “Spring Awakening” (2006), “Avenue Q” (2003, currently running), “The Book of Mormon” (2011, currently running), or the next provocative production. The notice and comment procedure in the Commission’s rule is totally devoid of any procedural safeguards to reduce the danger of suppressing constitutionally protected speech.²⁰

4. Part 74 Licenses Will Solve These Problems.

As discussed above, professional theatrical performances have the same priorities and requirements that the Commission considered when it made television and motion picture production companies eligible for Part 74 LPAS licenses. Now these licenses should be available to venue owners, producers, and audio equipment owners, engineers, and technical consultants who design and coordinate sound systems for major live productions. Although only one entity would need to be a licensee in order for a given production to be entered into the database, the party that would bear the responsibility may vary from place to place and from time to time. The primary factor for establishing eligibility for a license should be the knowledge and responsibility necessary for understanding and complying with the Commission’s rules. The Commission could incorporate certifications to that effect in the application for Part 74 LPAS licenses. In addition, the application could include a pledge that the licensee would not register

²⁰ *Southeastern Promotions, LTD. v. Conrad*, 420 U.S. 546, 559 (1975) (finding unconstitutional municipal action that blocked presentation of the musical “Hair” because refusal to provide a license was a prior restraint under a system lacking in constitutionally required minimal procedural safeguards). *See also, Turner Broadcasting System, Inc. v. FCC*, 512 U.S. 622, 662 (1994) (holding that content-neutral regulation must satisfy an intermediate level of scrutiny, including a determination that the regulation is no greater than that essential to the furtherance of the government’s interest).

more channels, a larger location, or more time than is necessary for set-up, rehearsals, and performances.

The Commission has noted that the vast majority of wireless microphone uses will be shielded from TV Band Device interference because they will be in either reserved channels or in channels unavailable to TV Band Devices.²¹ For the immediate future, the number of microphones that can be accommodated in this way varies significantly from location to location.²² Therefore, it is difficult to make the number of wireless units a qualifying factor for license eligibility. Professional sound design and world-class wireless microphone equipment is expensive. Ticket sales are necessary to cover these costs, and the number of seats available for a performance thus becomes a very rough proxy for the expertise that should be required for Part 74 license eligibility. This metric does not work in a number of circumstances, such as outdoor performances in Central Park or on the Mall in Washington, D.C. However, if the Commission needs a size threshold, an audience capacity of 500 or more in a single auditorium could be used.²³

²¹ Wireless Microphone PN, at 3.

²² This determination will require predictable, consistent guidance from the databases. This was not always the case with the two databases used in the Commission's Beta Test and, indeed, as of January 15, 2013, spot checking revealed different channel designations for the same location in the reports generated by the Spectrum Bridge and Telcordia databases. Additionally, channel availability may be changed completely by the proposed repacking of the television band. *See* Part III below.

²³ Actor's Equity, founded in 1913, the labor union representing more than 49,000 actors and stage managers in the United States, uses the 500-seat threshold in contracts to determine the appropriate wage scale for a production.

III. Changes Proposed by the TV Spectrum Auction Notice Will Affect Wireless Microphones.

The Auction Notice asked about wireless microphone operations within a repacked broadcast television band, including a scenario without the two channels dedicated to wireless microphone use.²⁴ A review of reports generated by the existing TV Band databases for various markets shows a wide range in the numbers of channels available for wireless microphone use: exclusive, available, and “White Space” channels. Necessarily eliminating VHF channels that are not practicably useful because of the absence of any equipment further reduces these channels. The obvious assumption is that as the number of channels available for broadcasting is reduced, the number of available channels for wireless microphones would also decline proportionately. Yet nowhere are there fewer available channels than in the heart of the Broadway Theatre District and through skillful engineering and coordination, Broadway theatres have extracted use from every available slice of spectrum without causing interference. The fewer number of channels available, the greater will be the challenge.

Because of the low power specifications and need for coordination, it would be possible for wireless microphones to use guard bands as long as high-quality equipment is available for those bands. Wireless microphone users, licensed and unlicensed, should be permitted to use guard bands the same as any available TV channel. However, if the Commission were to establish a requirement that users of guard-band spectrum continually access a database to determine channel availability,²⁵ it would add a new challenge for equipment manufacturers and, given the need for very small transmitters that can be hidden in

²⁴ Auction Notice, ¶ 225.

²⁵ *Id.*, ¶ 226.

costumes and operations within closed theatre environments, designing wireless microphone transmitters with TV Band Device-type cognitive abilities will be an amazing feat. For the same reasons of power and location, however, wireless microphones are unlikely to interfere with other uses in or adjacent to guard bands.

The Commission expects the vast number of wireless microphone users to gravitate to the exclusive channels in each market. These channels do not vary from time to time or from location to location within the market, as some other channels may. They will be free from TV Band Device interference without the need for registration in a database. If one or more of the exclusive channels is eliminated through the repacking process, users will flow to the available and/or White Spaces channels. Coordination with many of these occasional and “amateur” users will be much more difficult than working with experienced audio professionals. In cases where coordination is impossible or the users cannot even be identified, those channels will be considered occupied and other wireless microphones will need to move to channels shared with TV Band Devices.

With the uncertainty of new TV band plans, wireless microphone users are increasing the tuning ranges of their systems whenever possible. However, increased frequency agility is unavailable to many users because it goes hand in hand with proportionately increased costs.²⁶

²⁶ Additionally, because wireless microphones have not been able to operate on TV channel 37, most available equipment does not straddle the unusable channel: it begins at TV channel 38 and moves up from there, or starts lower in the TV band and ends at TV channel 36. The Commission could make more efficient use of reserved channels by positioning them either side of channel 37 in a particular market, rather than one channel on either side.

In both the Wireless Microphone PN²⁷ and the Auction Notice,²⁸ the Commission sought comment on more efficient use of spectrum by wireless microphones. Broadway League members pride themselves on the degree of spectrum efficiency that they are able to accomplish through careful coordination among theatres and the use of modern microphone technology. Broadway audiences are unaware of these efforts because they experience only the highest quality sound. Most League theatres and producers do not own wireless microphone equipment; they rent it from sound production companies. Rental specifications demand high quality sound. The number of microphones needed for a major musical production along with the close proximity of Broadway theatres mandate equipment that uses spectrum efficiently. As newer and more efficient equipment becomes available, League members will support manufacturers and encourage their sound equipment suppliers to adopt it, as long as it meets the demands of discerning audiophiles and is reasonably affordable. This would include digital wireless microphones, which for now still have problems with latency that audiences find disturbing.²⁹

²⁷ Wireless Microphone PN, at 5-6.

²⁸ Auction Notice, at ¶¶ 224-25.

²⁹ *See, Unlicensed Operation in the TV Broadcast Bands*, 25 FCC Rcd 18661, ¶ 30 (2010).

IV. Conclusion.

The Broadway League urges the Commission to modify its Part 74 rules to allow eligibility for LPAS licenses for professional theatres and the producers, audio engineers, and sound designers that provide professional quality audio presentations through the use of wireless microphones and cue and control devices. The League remains available to answer any questions regarding its positions and requests in this vital area.

Respectfully submitted,

THE BROADWAY LEAGUE, INC.

/s/

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